Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) A method of making an array, the method comprising:

applying building block molecules to a solid support in a plurality of regions, each region:

comprising 2, 3, 4, 5, or 6 different building block molecules;

being a contiguous portion of the surface of the solid support with the different building block molecules distributed randomly ~~and evenly~~ throughout the contiguous region; and

having the shape of a spot;

independently covalently immobilizing the different building block molecules to the solid support in the regions;

producing an array comprising a candidate artificial receptor, a lead artificial receptor, a working artificial receptor, or a combination thereof;

wherein:

a first region comprises a first combination of building block molecules and a second region comprises a second combination of building block molecules;

at least one of the building block molecules is naïve with respect to a test ligand; and

each building block molecule comprises a framework and n recognition elements and is independently of the formula:

$$\text{framework-(recognition element)}_n$$

in which:

n=1, 2, or 3; each recognition element is independently covalently coupled to the framework; and the framework comprises a functional group effective for covalent coupling to a support or a linker;

the framework is alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, or heteroaryl alkyl; substituted with 1 to 4 functional groups;

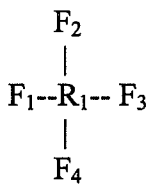
the functional groups independently being carboxyl, amine, hydroxyl, phenol, carbonyl, or thiol;

each recognition element is independently a 1-12 carbon alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, or heteroaryl alkyl moiety; substituted with a group with a property of positive charge, negative charge, acid, base, electron acceptor, electron donor, hydrogen bond donor, hydrogen bond acceptor, free electron pair, π electrons, charge polarization, hydrophilicity, or hydrophobicity; and

when the building block molecule comprises an amino acid derivative, wherein amino acid derivatives are defined as a core feature having the chemical structure –NH-C-C(O)-, the building block molecule comprises a single amino acid derivative and the framework is the amino acid derivative.

2. (Currently Amended) The method of claim 1, wherein each recognition element is independently unsubstituted or substituted with a moiety selected from the group consisting of amine, quaternary ammonium, carboxylate, phenol, phosphate, phosphonate, phosphinate, sulphate, sulphonate, thiocarboxylate, hydroxamic acid, sulfoxide, betaine, amine oxide, amide, carboxyl, alcohol, ether, thiol, thioether, ester, thio ester, borane, borate, metal complex, alkyl, alkene, alkyne, aromatic moiety, and plurality thereof.

3. (Previously presented) The method of claim 1, wherein the framework has the formula:



in which:

R_1 is 1-12 carbon alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, or heteroaryl alkyl;

F_1 and F_2 are independently carboxyl, amine, hydroxyl, phenol, carbonyl, or thiol group; or are independently 1-12 carbon alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, heteroaryl alkyl, or inorganic group substituted with carboxyl, amine, hydroxyl, phenol, carbonyl, or thiol group;

F_3 and F_4 are independently absent, carboxyl, amine, hydroxyl, phenol, carbonyl, or thiol group; or are independently absent, or 1-12 carbon alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, heteroaryl alkyl, or inorganic group substituted with carboxyl, amine, hydroxyl, phenol, carbonyl, or thiol group.

4-9. (Canceled)

10. (Previously presented) The method of claim 1, further comprising:

mixing 2, 3, 4, 5, or 6 different activated building block molecules; and

wherein applying comprises applying the mixture of building block molecules to the solid support in at least one of the regions.

11. (Original) The method of claim 1, wherein the solid support comprises a glass plate or microscope slide.

12-13. (Canceled)

14. (Currently amended) A method of making an artificial receptor, the method comprising:

applying building block molecules to a region on a solid support, the region comprising 2, 3, 4, 5 , or 6 different building block molecules;

the region being a contiguous portion of the surface of the solid support with the different building block molecules distributed randomly and evenly throughout the contiguous region; and

independently covalently coupling the different building block molecules to the solid support in the region;

producing a candidate artificial receptor, a lead artificial receptor, a working artificial receptor, or a combination thereof;

2 or more of the different building block molecules together forming the candidate artificial receptor, the lead artificial receptor, the working artificial receptor, or combination thereof;

at least one of the building block molecules being naïve with respect to a test ligand;

each building block molecule comprises a framework and n recognition elements and is independently of the formula:

$$\text{framework-(recognition element)}_n$$

in which:

n=1, 2, or 3; each recognition element is independently covalently coupled to the framework; and the framework comprises a functional group effective for covalent coupling to a support or a linker;

the framework is alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, or heteroaryl alkyl; substituted with 1 to 4 functional groups;

the functional groups independently being carboxyl, amine, hydroxyl, phenol, carbonyl, or thiol;

each recognition element is independently a 1-12 carbon alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, or heteroaryl alkyl moiety; substituted with a group with a property of positive charge, negative charge, acid, base, electron acceptor, electron donor, hydrogen bond donor, hydrogen bond acceptor, free electron pair, π electrons, charge polarization, hydrophilicity, or hydrophobicity; and

when the building block molecule comprises an amino acid derivative, wherein amino acid derivatives are defined as a core feature having the chemical structure –NH-C-C(O)-, the building block molecule comprises a single amino acid derivative and the framework is the amino acid derivative.

15. (Original) The method of claim 14, wherein the region is a spot.

16-82. (Canceled)

83. (Currently amended) The method of claim 14, further comprising:

mixing 2, 3, 4, 5, or 6 different activated building block molecules; and

wherein applying comprises applying the mixture of building block molecules to the solid support in ~~at least one of~~ the region[[s]].

84. (Previously presented) The method of claim 14, wherein applying comprises applying individual activated building block molecules to the support in the region.

85. (Previously presented) The method of claim 14, further comprising:

providing a set of building block molecules; and

selecting from the set of building block molecules 2, 3, 4, 5, or 6 different building block molecules;

wherein applying comprises applying the selected building block molecules to the support in the region.

86. (Previously presented) The method of claim 14, further comprising:

providing a support comprising a functionalized lawn;

wherein coupling comprises coupling the different building block molecules to the lawn in region.

87. (Previously presented) The method of claim 14, wherein the building block molecules coupled to the support are in proximity to one another.

88. (Previously presented) The method of claim 14, wherein the region on the solid support comprises:

2 or 3 different building block molecules;

2, 3, or 4 different building block molecules;

2, 3, 4, or 5 different building block molecules;

3, 4, or 5 different building block molecules; or

3, 4, 5, or 6 different building block molecules.

89. (Previously presented) The method of claim 14, further comprising:

selecting a structurally diverse set of building block molecules, the set of structurally diverse building block molecules comprising at least six of the structural characteristics of: positive charge, negative charge, acid, base, electron acceptor, electron donor, hydrogen bond donor, hydrogen bond acceptor, free electron pair, π electrons, charge polarization, hydrophilicity, or hydrophobicity.

90. (Previously presented) The method of claim 14, wherein the building block molecules comprise:

one or more building block molecules comprising a positively charged recognition element;

one or more building block molecules comprising a negatively charged recognition element;

one or more building block molecules comprising an acidic recognition element;

one or more building block molecules comprising a basic recognition element;

one or more building block molecules comprising an electron donating recognition element;

one or more building block molecules comprising an electron accepting recognition element;

one or more building block molecules comprising a hydrogen bond donor recognition element;

one or more building block molecules comprising a hydrogen bond acceptor recognition element;

one or more building block molecules comprising a polar recognition element;

one or more building block molecules comprising a recognition element with free electron pair(s);

one or more building block molecules comprising a recognition element with π electrons;

one or more building block molecules comprising a hydrophilic recognition element; or

one or more building block molecules comprising a hydrophobic recognition element.

91. (Currently amended) The method of claim 14, wherein each recognition element is independently unsubstituted or substituted with a moiety selected from the group consisting of amine, quaternary ammonium, carboxylate, phenol, phosphate, phosphonate, phosphinate, sulphate, sulphonate, thiocarboxylate, hydroxamic acid, sulfoxide, betaine, amine oxide, amide, carboxyl, alcohol, ether, thiol, thioether, ester, thio ester, borane, borate, metal complex, alkyl, alkene, alkyne, aromatic moiety, and plurality thereof.

92. (Previously presented) The method of claim 14, wherein a recognition element is substituted with or to form:

protonated phosphate, protonated phosphonate, protonated phosphinate, protonated sulphate, or protonated sulphinate;

alkyl amine, alkyl diamine, heteroalkyl amine, aryl amine, heteroaryl amine, aryl alkyl amine, heterocyclic amine, amidine, hydrazine, urea, trimethyl alkyl quaternary ammonium, dimethyl ethyl alkyl quaternary ammonium, dimethyl alkyl quaternary ammonium, aryl alkyl quaternary ammonium, or pyridinium quaternary ammonium;

alkyl carboxylate, aryl carboxylate, aryl alkyl carboxylate, or thiocarboxylate;

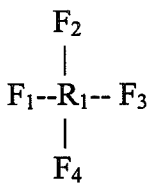
phosphonate or phosphinate;

primary alcohol, secondary alcohol, tertiary alcohol, or aromatic alcohol;

lower alkyl, substituted alkyl, cycloalkyl, aryl alkyl, heteroaryl alkyl, lower alkene, aryl alkene, unsubstituted aryl, heteroaryl, substituted aryl, aryl alkyl, heteroaryl alkyl, alkyl substituted aryl, or polyaromatic hydrocarbon; or

a plurality thereof.

93. (Previously presented) The method of claim 14, wherein the framework has the formula:



in which:

R_1 is 1-12 carbon alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, or heteroaryl alkyl;

F_1 and F_2 are independently carboxyl, amine, hydroxyl, phenol, carbonyl, or thiol group; or are independently 1-12 carbon alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, heteroaryl alkyl, or inorganic group substituted with carboxyl, amine, hydroxyl, phenol, carbonyl, or thiol group;

F_3 and F_4 are independently absent, carboxyl, amine, hydroxyl, phenol, carbonyl, or thiol group; or are independently absent, or 1-12 carbon alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, heteroaryl alkyl, or inorganic group substituted with carboxyl, amine, hydroxyl, phenol, carbonyl, or thiol group.

94. (Previously presented) The method of claim 93, wherein:

R_1 is 1-6 carbon alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, or heteroaryl alkyl;

F_1, F_2, F_3, or F_4 are independently 1-6 carbon alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, heteroaryl alkyl, or inorganic group substituted with carboxyl, amine, hydroxyl, phenol, carbonyl, or thiol group.

F_3 is absent; or

F_3 and F_4 are absent.

95. (Currently amended) The method of claim 14, wherein the framework is:

a natural or synthetic amino acid, an α-hydroxy acid, or a thioic acid; or

a β-amino acid[[s]] or homo or β analog of a natural amino acid.

96. (Previously presented) The method of claim 14, wherein the framework is an amino acid with an amine, hydroxyl, phenol, carboxyl, thiol, thioether, or amidino group on its side chain.

97. (Previously presented) The method of claim 14, wherein the framework is a serine, threonine, tyrosine, aspartic acid, glutamic acid, asparagine, glutamine, cysteine, lysine, arginine, or histidine moiety.

98. (Previously presented) The method of claim 14, wherein the building block molecule further comprises a linker, and

the linker is a alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, heteroaryl alkyl, ethoxy or propoxy oligomer, or glycoside moiety;

substituted with a carboxyl, alcohol, phenol, thiol, amine, carbonyl, or maleimide group.

99. (Previously presented) The method of claim 14, comprising one or more building block molecules further comprising a linker and independently being of the formula:

linker-framework-(first recognition element)
|
(second recognition element)

in which the linker, first recognition element, and second recognition element are independently covalently coupled to the framework.

100. (Previously presented) The method of claim 99, wherein the framework is an amino acid.

101. (Previously presented) The method of claim 100, wherein the amino acid is serine, threonine, or tyrosine.

102. (Previously presented) The method of claim 101, wherein the amino acid is tyrosine.

103. (Previously presented) The method of claim 99, wherein the linker is of the formula $(CH_2)_nC(O)$-, with n=1-16.

104. (Previously presented) The method of claim 99, wherein the first recognition element and second recognition element independently are of formulas

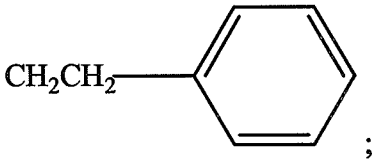
A1

$CH_2\ CH_3$;

A2

$CH_2CH(CH_3)_2$;

A3



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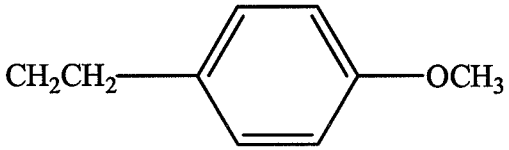
A4



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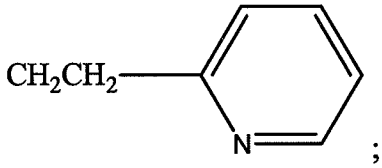
A5



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A6

CH_2CH_2-O-CH_3;

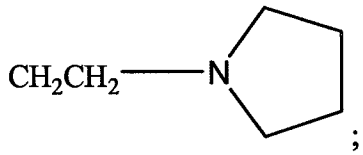
A7

CH_2CH_2-OH;

A8

CH_2CH_2-NH-C(O)CH_3;

A9



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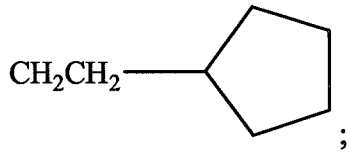
B1

CH_3;

B2



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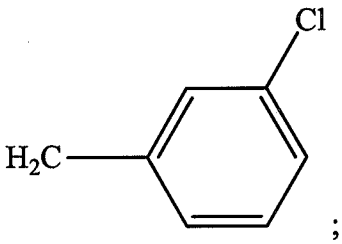
B3



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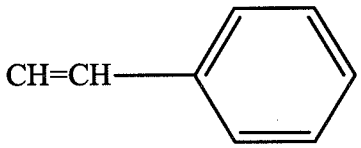
B4



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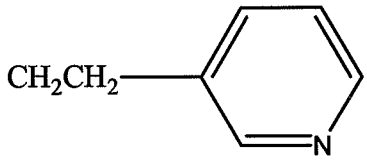
B5



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B6

CH_2-S-CH_3;

B7

$CH_2CH(OH)CH_3$;

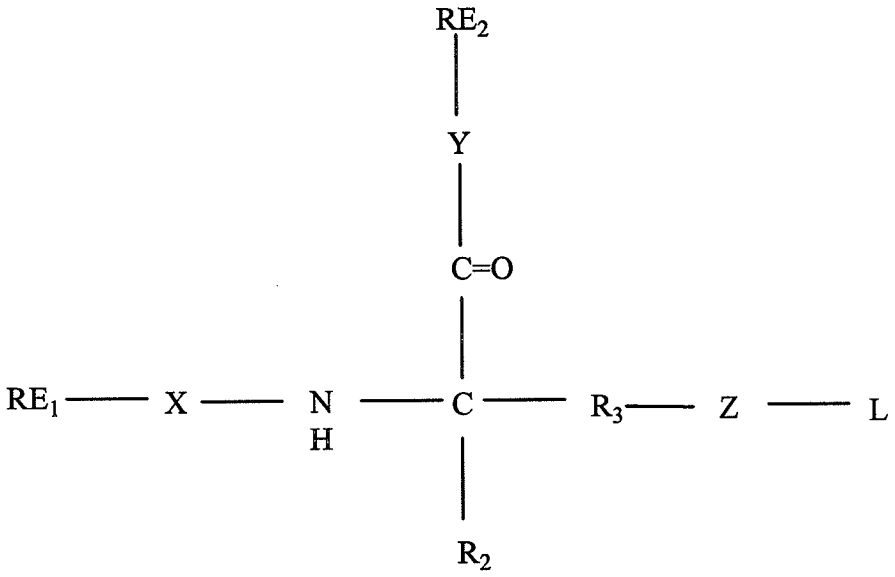
B8

$CH_2CH_2C(O)$-NH_2; or

B9

$CH_2CH_2CH_2$-N-$(CH_3)_2$.

105. (Previously presented) The method of claim 14, comprising one or more building block molecules independently being of the formula:



in which:

X is absent or C=O;

Y is absent, NH, or O; Z is O;

R_2 is H or CH_3;

R_3 is CH_2 or CH_2-phenyl;

RE_1 is B1, B2, B3, B4, B5, B6, B7, B8, B9, A1, A2, A3, A4, A5, A6, A7, A8, or A9;

RE_2 is A1, A2, A3, A4, A5, A6, A7, A8, A9, B1, B2, B3, B4, B5, B6, B7, B8, or B9;

L is $(CH_2)_nCOOH$, with n=1-16;

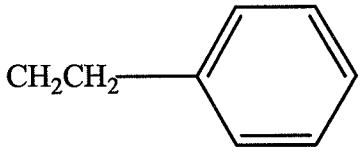
A1 is

;

A2 is

;

A3 is



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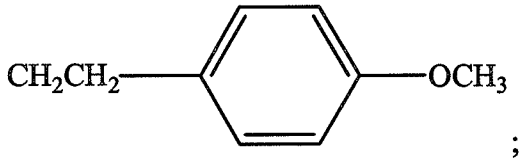
A4 is



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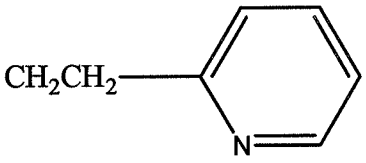
A5 is



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A6 is

CH_2CH_2-O-CH_3;

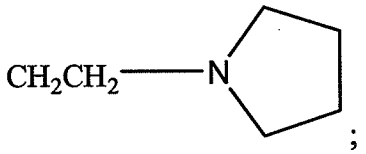
A7 is

CH_2CH_2-OH;

A8 is

CH_2CH_2-NH-C(O)CH_3;

A9 is



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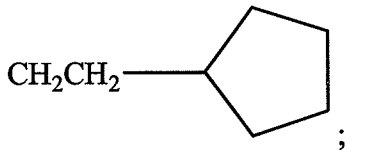
B1 is

CH_3;

B2 is



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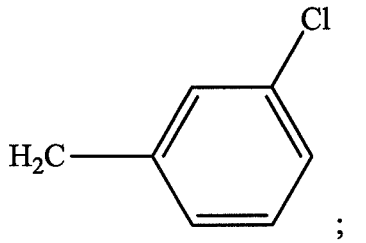
B3 is



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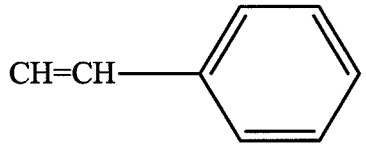
B4 is



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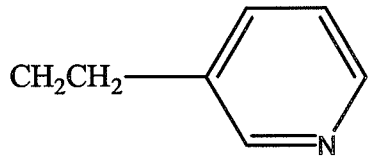
B5 is



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B6 is

CH_2-S-CH_3;

B7 is

$CH_2CH(OH)CH_3$;

B8 is

$CH_2CH_2C(O)\text{-}NH_2$; and

B9 is

$CH_2CH_2CH_2\text{-}N\text{-}(CH_3)_2$.

106. (Previously presented) The method of claim 14, wherein the building block molecules comprise building block molecules independently of the formula:

framework-(first recognition element);

framework-(first recognition element)
|
(second recognition element); or

(third recognition element)
|
framework-(first recognition element)
|
(second recognition element);

in which the first recognition element, second recognition element, and third recognition element are independently covalently coupled to the framework.

107. (Previously presented) The method of claim 14, wherein the building block molecules further comprise a linker and the building block molecules comprise building block molecules independently of the formula:

linker-framework-(recognition element)$_n$;

linker-framework-(first recognition element);

linker-framework-(first recognition element)
|
(second recognition element); or

(third recognition element)
|
linker-framework-(first recognition element)
|
(second recognition element);

in which the linker, first recognition element, and second recognition element are independently covalently coupled to the framework.

108. (Previously presented) The method of claim 14, wherein the solid support comprises a glass plate, microscope slide, optical fiber, a bead, a resin, a gel, a test tube, a microwell, a capillary, or a microchannel.

109. (Previously presented) The method of claim 14, wherein the solid support comprises a glass bead, a polymer bead, a silica gel support, a microporous glass bead, or a microporous polymer bead.

110. (Previously presented) The method of claim 14, wherein the solid support comprises a signaling surface of a surface plasmon resonance detector.

111. (Previously presented) The method of claim 14, wherein the solid support comprises a surface of a surface acoustic wave or quartz crystal microbalance.

112. (Previously presented) The method of claim 14, wherein the solid support comprises a glass plate or microscope slide.

113. (Previously presented) The method of claim 14, wherein applying comprises piezoelectric spotting, pin spotting, or electromagnetic spotting.

114. (Previously presented) The method of claim 1, wherein applying comprises applying individual activated building block molecules to the support in at least one of the regions.

115. (Previously presented) The method of claim 1, further comprising:

providing a set of building block molecules; and

selecting from the set of building block molecules 2, 3, 4, 5, or 6 different building block molecules;

wherein applying comprises applying the selected building block molecules to the support in at least one of the regions.

116. (Previously presented) The method of claim 1, further comprising:

applying a single building block molecule to the solid support in at least one control region;

coupling the building block molecule to the solid support in the control region;

wherein a first control region comprises a first building block molecule but no other building block molecules and a second control region comprises a second building block molecule but no other building block molecules.

117. (Previously presented) The method of claim 1, wherein one or more of the combinations of building block molecules is replicated in a plurality of regions.

118. (Previously presented) The method of claim 1, further comprising:

providing a support comprising a functionalized lawn;

wherein coupling comprises coupling the different building block molecules to the lawn in regions.

119. (Previously presented) The method of claim 1, wherein:

a third region comprises a third combination of building block molecules;

a fourth region comprises a fourth combination of building block molecules;

wherein the series continues through region n (an n^{th} region) comprising combination n (an n^{th} combination) of building block molecules and n is a positive integer less than about 1.66 million.

120. (Previously presented) The method of claim 164, wherein n is less than or equal to 816, 2300, 3,060 3,240, 12,650, 14,950, 85,320, 88,560, 100,000, 1.66 million, or 1,663,740.

121. (Previously presented) The method of claim 1, wherein the building block molecules coupled to the support are in proximity to one another.

122. (Previously presented) The method of claim 1, wherein the region on the solid support comprises:

2 or 3 different building block molecules;

2, 3, or 4 different building block molecules;

2, 3, 4, or 5 different building block molecules;

3, 4, or 5 different building block molecules; or

3, 4, 5, or 6 different building block molecules.

123. (Previously presented) The method of claim 1, further comprising:

selecting a structurally diverse set of building block molecules, the set of structurally diverse building block molecules comprising at least six of the structural characteristics of: positive charge, negative charge, acid, base, electron acceptor, electron donor, hydrogen bond donor, hydrogen bond acceptor, free electron pair, π electrons, charge polarization, hydrophilicity, or hydrophobicity.

124. (Previously presented) The method of claim 1, wherein the building block molecules comprise structural characteristics of: positive charge, negative charge, acid, base, electron acceptor, electron donor, hydrogen bond donor, hydrogen bond acceptor, free electron pair, π electrons, charge polarization, hydrophilicity, or hydrophobicity.

125. (Previously presented) The method of claim 124, wherein the building block molecules comprise:

one or more building block molecules comprising a positively charged recognition element;

one or more building block molecules comprising a negatively charged recognition element;

one or more building block molecules comprising an acidic recognition element;

one or more building block molecules comprising a basic recognition element;

one or more building block molecules comprising an electron donating recognition element;

one or more building block molecules comprising an electron accepting recognition element;

one or more building block molecules comprising a hydrogen bond donor recognition element;

one or more building block molecules comprising a hydrogen bond acceptor recognition element;

one or more building block molecules comprising a polar recognition element;

one or more building block molecules comprising a recognition element with free electron pair(s);

one or more building block molecules comprising a recognition element with π electrons;

one or more building block molecules comprising a hydrophilic recognition element; or

one or more building block molecules comprising a hydrophobic recognition element.

126. (Previously presented) The method of claim 1, wherein a recognition element is substituted with or to form:

protonated phosphate, protonated phosphonate, protonated phosphinate, protonated sulphate, or protonated sulphinate;

alkyl amine, alkyl diamine, heteroalkyl amine, aryl amine, heteroaryl amine, aryl alkyl amine, heterocyclic amine, amidine, hydrazine, urea, trimethyl alkyl quaternary ammonium, dimethyl ethyl alkyl quaternary ammonium, dimethyl alkyl quaternary ammonium, aryl alkyl quaternary ammonium, or pyridinium quaternary ammonium;

alkyl carboxylate, aryl carboxylate, aryl alkyl carboxylate, or thiocarboxylate;

phosphonate or phosphinate;

primary alcohol, secondary alcohol, tertiary alcohol, or aromatic alcohol;

lower alkyl, substituted alkyl, cycloalkyl, aryl alkyl, heteroaryl alkyl, lower alkene, aryl alkene, unsubstituted aryl, heteroaryl, substituted aryl, aryl alkyl, heteroaryl alkyl, alkyl substituted aryl, or polyaromatic hydrocarbon; or

a plurality thereof.

127. (Previously presented) The method of claim 3, wherein:

R_1 is 1-6 carbon alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, or heteroaryl alkyl;

F_1, F_2, F_3, or F_4 are independently 1-6 carbon alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, heteroaryl alkyl, or inorganic group substituted with carboxyl, amine, hydroxyl, phenol, carbonyl, or thiol group.

F_3 is absent; or

F_3 and F_4 are absent.

128. (Currently amended) The method of claim 1, wherein the framework is:

a natural or synthetic amino acid, an α-hydroxy acid, or a thioic acid; or

a β-amino acid[[s]] or homo or β analog of a natural amino acid.

129. (Previously presented) The method of claim 1, wherein the framework is an amino acid with an amine, hydroxyl, phenol, carboxyl, thiol, thioether, or amidino group on its side chain.

130. (Previously presented) The method of claim 1, wherein the framework is a serine, threonine, tyrosine, aspartic acid, glutamic acid, asparagine, glutamine, cysteine, lysine, arginine, or histidine moiety.

131. (Previously presented) The method of claim 1, wherein the building block molecule further comprises a linker, and

the linker is a alkyl, substituted alkyl, cycloalkyl, heterocyclic, substituted heterocyclic, aryl alkyl, aryl, heteroaryl, heteroaryl alkyl, ethoxy or propoxy oligomer, or glycoside moiety;

substituted with a carboxyl, alcohol, phenol, thiol, amine, carbonyl, or maleimide group.

132. (Previously presented) The method of claim 1, comprising one or more building block molecules further comprising a linker and independently being of the formula:

linker-framework-(first recognition element)

|
(second recognition element)

in which the linker, first recognition element, and second recognition element are independently covalently coupled to the framework.

133. (Previously presented) The method of claim 132, wherein the framework is an amino acid.

134. (Previously presented) The method of claim 133, wherein the amino acid is serine, threonine, or tyrosine.

135. (Previously presented) The method of claim 134, wherein the amino acid is tyrosine.

136. (Previously presented) The method of claim 132, wherein the linker is of the formula $(CH_2)_nC(O)$-, with n=1-16.

137. (Previously presented) The method of claim 132, wherein the first recognition element and second recognition element independently are of formulas

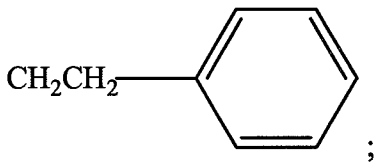
A1

$CH_2\ CH_3$;

A2

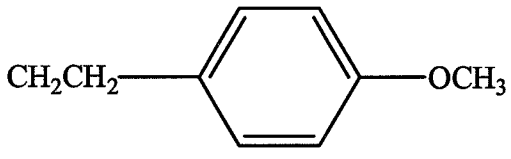
$CH_2CH(CH_3)_2$;

A3



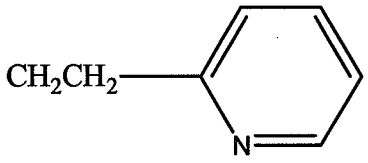
;

A4



;

A5



;

A6

CH_2CH_2-O-CH_3;

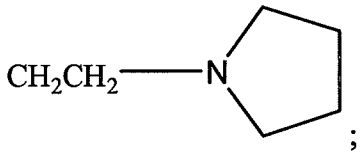
A7

CH_2CH_2-OH;

A8

CH_2CH_2-NH-C(O)CH_3;

A9

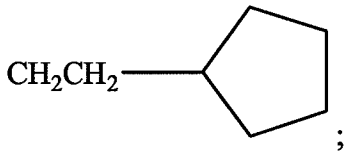


;

B1

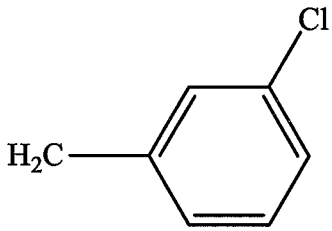
CH_3;

B2



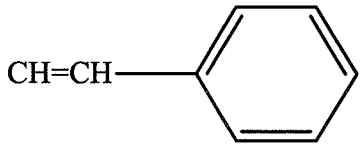
;

B3



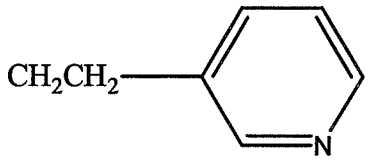
;

B4



;

B5



;

B6

CH_2-S-CH_3;

B7

$CH_2CH(OH)CH_3$;

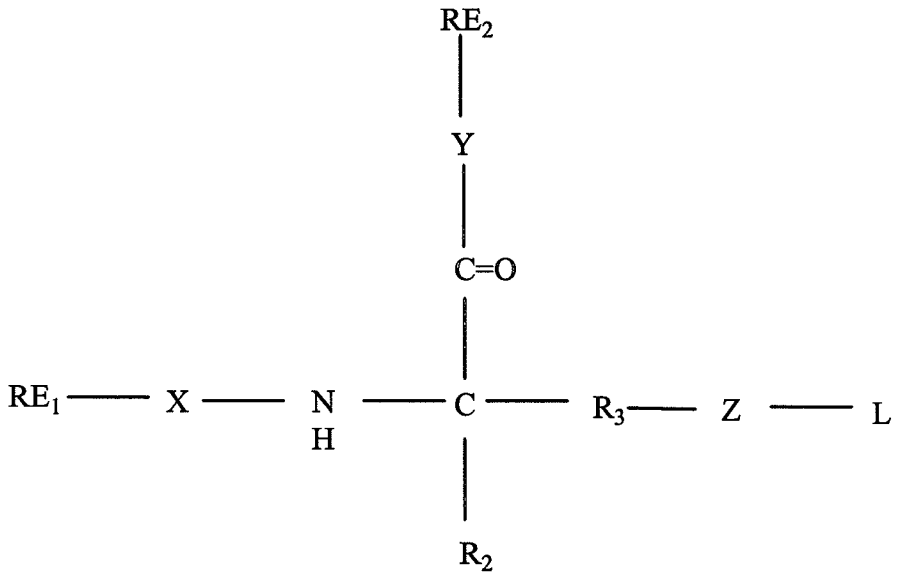
B8

$CH_2CH_2C(O)\text{-}NH_2$; or

B9

$CH_2CH_2CH_2\text{-}N\text{-}(CH_3)_2$.

138. (Previously presented) The method of claim 1, comprising one or more building block molecules independently being of the formula:



in which:

X is absent or C=O;

Y is absent, NH, or O; Z is O;

R_2 is H or CH_3;

R_3 is CH_2 or CH_2-phenyl;

RE_1 is B1, B2, B3, B4, B5, B6, B7, B8, B9, A1, A2, A3, A4, A5, A6, A7, A8, or A9;

RE_2 is A1, A2, A3, A4, A5, A6, A7, A8, A9, B1, B2, B3, B4, B5, B6, B7, B8, or B9;

L is $(CH_2)_nCOOH$, with n=1-16;

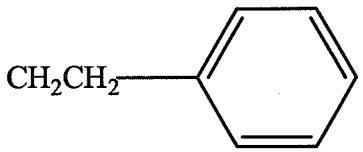
A1 is

$CH_2\ CH_3$;

A2 is

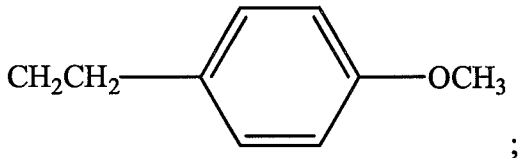
$CH_2CH(CH_3)_2$;

A3 is



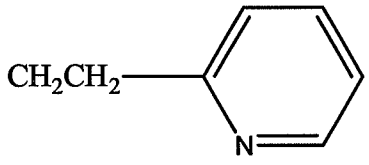
;

A4 is



;

A5 is



;

A6 is

CH_2CH_2-O-CH_3;

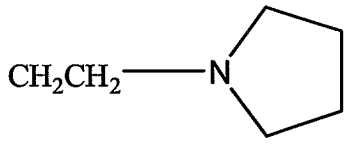
A7 is

CH_2CH_2-OH;

A8 is

CH_2CH_2-NH-C(O)CH_3;

A9 is

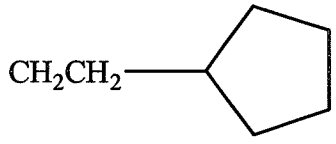


;

B1 is

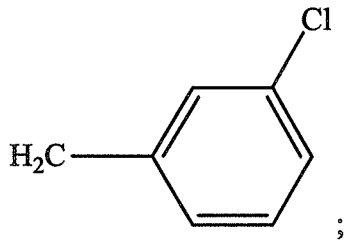
CH_3;

B2 is



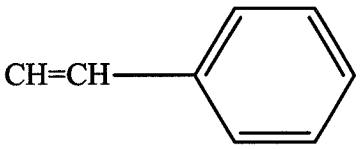
;

B3 is



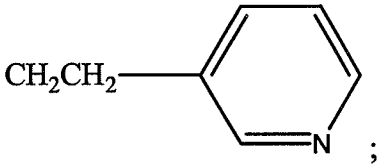
;

B4 is



;

B5 is



;

B6 is

CH_2-S-CH_3;

B7 is

$CH_2CH(OH)CH_3$;

B8 is

$CH_2CH_2C(O)$-NH_2; and

B9 is

$CH_2CH_2CH_2$-N-$(CH_3)_2$.

139. (Previously presented) The method of claim 1, wherein the building block molecules comprise building block molecules independently of the formula:

framework-(first recognition element);

framework-(first recognition element)
|
(second recognition element); or

(third recognition element)
|
framework-(first recognition element)
|
(second recognition element);

in which the first recognition element, second recognition element, and third recognition element are independently covalently coupled to the framework.

140. (Previously presented) The method of claim 1, wherein the building block molecules further comprise a linker and the building block molecules comprise building block molecules independently of the formula:

linker-framework-$(\text{recognition element})_n$;

linker-framework-(first recognition element);

linker-framework-(first recognition element)
|
(second recognition element); or

(third recognition element)
|
linker-framework-(first recognition element)
|
(second recognition element);

in which the linker, first recognition element, and second recognition element are independently covalently coupled to the framework.

141. (Previously presented) The method of claim 1, wherein the solid support comprises a glass plate, microscope slide, optical fiber, a bead, a resin, a gel, a test tube, a microwell, a capillary, or a microchannel.

142. (Previously presented) The method of claim 1, wherein the solid support comprises a glass bead, a polymer bead, a silica gel support, a microporous glass bead, or a microporous polymer bead.

143. (Previously presented) The method of claim 1, wherein the solid support comprises a signaling surface of a surface plasmon resonance detector.

144. (Previously presented) The method of claim 1, wherein the solid support comprises a surface of a surface acoustic wave or quartz crystal microbalance.

145. (Previously presented) The method of claim 1, wherein applying comprises piezoelectric spotting, pin spotting, or electromagnetic spotting.

146. (Previously presented) The method of claim 1, wherein 2 or more of the different building block molecules together form a candidate artificial receptor, a lead artificial

receptor, a working artificial receptor, or a combination thereof in which more than one building block molecule interacts with the test ligand.